ADDENDUM 3

STANDARD OPERATING PROCEDURE FOR UPGRADED INDOOR AIR SAMPLING

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LIST OF FORMS
(Following Text)

1.0 INTRODUCTION

This Attachment presents the upgraded indoor air sampling protocol employed by Conestoga-Rovers & Associates (CRA) to evaluate the potential presence of volatile organic compounds (VOCs) in indoor air due to subsurface soil and/or groundwater impacts. The Respondents prepared this upgraded indoor air sampling SOP following notice of restricted Site access to properties owned by the South Dayton Remediation Trust and discussions held with USEPA during VI mitigation conference calls held in July and August 2014. The protocol presented herein consists of collection of indoor air samples using 6-liter Summa™ canisters. This indoor air sampling protocol has been developed in consideration of the sampling procedures recommended in the following regulatory guidance documents:

- "*Indoor Air Sampling and Evaluation Guide*" dated April 2002 and prepared by the Massachusetts Department of Environmental Protection (MDEP) (MDEP, 2002)
- "*Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion – Interim Final*" dated December 15, 2004 (and revised February 7, 2005) and prepared by the California Environmental Protection Agency (Cal EPA) (Cal EPA, 2004)
- "*Draft Vapor Intrusion Pilot Program Guidance*" dated April 26, 2006 and prepared by the Indiana Department of Environmental Management (IDEM) (IDEM, 2006)
- United States Environmental Protection Agency (USEPA) – Region 5 - *Vapor Intrusion Guidebook,* October 2010 (USEPA, 2010)

Section 2.0 presents the rationale for the proposed upgraded indoor air sample locations. Section 3.0 presents the upgraded indoor air sample collection procedure, including quality assurance/quality control (QA/QC) measures and laboratory analytical methodology to be applied in the sample analysis.

In June 2011, the Respondents completed physical building surveys to obtain data that allowed for qualitative assessment of factors that potentially could influence indoor air quality. The surveys included the recording of building configurations (i.e., building layout, attached garages, utility entrances, ventilation system design, foundation conditions, presence of foundation sump, and building material types). In addition to the physical building layout and features, the surveys included interviews with building occupants to determine daily operations and occupant lifestyle choices that could potentially influence indoor air quality, such as use of cleaning products, indoor storage of paints and/or petroleum hydrocarbon products, smoking, use of aerosol consumer products, etc. The completed physical building survey forms (Form 1) were provided in Appendix D of the VI Mitigation Work Plan (CRA, May 2013).

2.0 UPGRADED INDOOR AIR SAMPLE LOCATIONS

Upgraded indoor air samples will be collected from the VI Mitigation buildings which are owned by the South Dayton Remediation Trust, and to which access for additional mitigation work has been restricted (i.e., Buildings 8, 9, 12, 14, 15, and 17). The upgraded indoor air samples will be collected from the lowest floor of the building. In all cases, this is the main floor of the buildings. An outdoor ambient air sample will be collected concurrently with the indoor air sample(s) from an upwind location on each building property.

The proposed indoor air sample locations were chosen based on the following criteria:

- Proximity to sub-slab probe locations from which chemical concentrations were greater than Ohio Department of Health screening levels
- Proximity to occupied spaces (i.e., offices, work areas)

Should the South Dayton Remediation Trust allow the Respondents to collect sub-slab samples, the proposed sub-slab sample locations are highlighted on the attached figures. The selected sub-slab probe locations are the locations where the greatest chemical concentrations were measured in each building. In some cases, access to the worst-case indoor air or sub-slab probe locations may not be feasible based on safety issues or due to business operations. Alternate sample locations are proposed, as detailed below.

Building 9 (B&G Trucking)

The greatest concentrations of TCE in Building 9 were sampled at SS-9-A. SS-9-A is located in the middle of a truck bay, and may be inaccessible due to the business operations and activities. In the situation where the South Dayton Remediation Trust permits sub-slab sample collection, yet SS-9-A is inaccessible, the Respondents propose SS-9-E as an alternative sample location because it is easily accessible, and will not interfere with business operations. In addition, SS-9-E is positioned farther away from the extraction points, and a sample from this location would serve to monitor the performance of the SSDS.

Building 15 (SIM Trainer)

The greatest concentrations of TCE in Building 15 were sampled at SS-15-B. SS-15-B is located in the middle of a gun range. The upgraded indoor air sampling plan requires indoor air samples to be collected at locations in close proximity to the worst-case sub-slab probes. Due to safety concerns associated with collecting indoor air samples from the gun range (near SS-15-B), the Respondents propose to collect indoor air

samples from the location IA-15-A. IA-15-A is located in an area more regularly occupied by tenants and customers than IA-15-B.

The proposed upgraded indoor air and sub-slab sample locations are highlighted on the attached figures.

When sub-slab concentrations have declined to less than ODH screening levels, the Respondents will revert back to the monitoring program specified in Section 4.5.2 of the VI Mitigation Work Plan. The VI Mitigation Work Plan Monitoring Program specifies completion of indoor air sampling from a subset of the buildings (20 percent of the operating systems and approved by USEPA prior to scheduling) annually from SSDS installation, provided the SSDS is still required.

3.0 UPGRADED INDOOR AIR SAMPLE COLLECTION PROCEDURE

The indoor and ambient air samples will be collected using a Summa™ canister (6-litre capacity) equipped with a critical orifice flow regulation device sized to allow the collection of an air sample over an 8-hour sampling period. The critical orifice flow regulation device will be supplied and calibrated by the laboratory selected to conduct the sample analysis.

To the extent possible, the indoor air samples will be collected with windows and doors closed to represent appropriately conservative conditions during sampling. If possible, windows, vents, and doors should be kept closed for a period of at least 12 hours prior to sample collection. In cases where vents in the area where the samples will be collected do not have closure mechanisms, plastic will be placed over accessible vents to prevent air circulation and maintain conservative conditions. In order to sample under these conditions, sampling may be scheduled to occur on weekends, dependent upon building access. During summer months, air conditioners typically would be operating under closed windows/doors conditions, and the operation of an air conditioner can be allowed during sample collection. This would be representative of season-specific ventilation conditions, and with the expected pattern of operation of the building. Care will be taken to deploy the Summa™ canisters away from the direct influence of any forced air emanating from an air conditioning unit or central air conditioning vents.

The indoor air sampling procedure is described as follows:

- Turn off ventilation (heating/cooling systems) if possible.
- Ensure all windows, vents and doors are closed. If required, cover openings with plastic to prevent air circulation.
- Samples will be collected from an occupied building and as close as practical to the center of the area, but away from high traffic areas to minimize the potential for disturbances during sample collection. Typically, sample canisters will be located between 1 to 1.5 meters above floor level.
- For each ambient air sample, a suitable upwind location (selected to minimize the potential for disturbances during sample collection) will be selected. The ambient air sample will be collected a minimum of 1 meter above grade (if possible) and located to minimize the potential for disturbance of the canister while providing protection from weather effects.
- Air sample canisters will be labeled with a unique sample designation number. Both the sample number and the sample location information will be recorded on the attached Form 2 – Indoor Air Sampling Field Data Sheet.

- The Summa™ canister vacuum will be measured immediately prior to canister deployment and recorded on Form 2 – Indoor Air Sampling Field Data Sheet.
- The unique sample designation number of each critical orifice flow controller will be recorded on the attached Form 2 – Indoor Air Sampling Field Data Sheet. The critical orifice flow controller will be installed, as supplied by the laboratory, on the canister and the canister will be opened fully at the beginning of sample collection period and start time recorded on Form 2 – Indoor Air Sampling Field Data Sheet.
- At the start and the end of the 8-hour sample period, a portable photoionization detector (PID) will be used to screen for VOC presence in the sample area. Results of the PID monitoring were recorded on Form 2 – Indoor Air Sampling Field Data Sheet.
- Other data recorded on Form 2 – Indoor Air Sampling Field Data Sheet will include: outside and interior temperatures both at the start and end of the sample period, equipment serial numbers, sampler name, and any comments.
- Following equipment setup, the building occupant (if present) will be given the list of instructions to follow while the Summa™ canister sample is being taken in the building. The instructions are listed in the attached Form 3 - Indoor Air Sampling Instructions to Building Occupants. The date and completion time of the 8-hour sample period will be written on Form 3 and the occupant will be instructed that the sampling team would be back to pick up the canister after approximately 8 hours.
- The sampling team will check on the canisters and flow controllers throughout the 8-hour sample period to ensure that no problems exist with sample collection.
- The canister valve will be closed fully at the end of the sample period (after 8 hours) and the end time recorded on the field data sheet. If there is evidence of canister disturbance during the sample collection, this will be recorded on Form 2 – Indoor Air Sampling Field Data Sheet.
- The Summa™ canister vacuum will be measured immediately after canister retrieval at the end of the 8-hour sample period and recorded on the field data sheet. Any samples where the canister reached atmospheric pressure will be rejected and the canisters returned for cleaning. The minimum vacuum required to be considered a valid sample will be 1 to 2 inch Hg vacuum. Once the vacuum is measured, the safety cap will be securely tightened on the inlet of the Summa™ canister prior to shipment to the laboratory under CRA chain of custody procedures. The requirement for residual vacuum retained in the canister following sample collection is to ensure that a driving force was maintained to collect a steady flow rate until the end of the sampling event.
- The Summa™ canister vacuum will be measured by the laboratory immediately prior to sample analysis and recorded on the analytical data report.

- All canisters will be cleaned in accordance with United States Environmental Protection Agency (USEPA) Method TO-15 and documentation of the cleaning activities will be obtained from the laboratory.

3.1 QUALITY ASSURANCE/QUALITY CONTROL

Quality Assurance/Quality Control (QA/QC) samples will collected during the indoor air sampling. QA/QC samples will include:

- The ambient air sample
- One duplicate

3.2 ANALYTICAL METHOD/LABORATORY

The soil vapor samples will be analyzed by a certified laboratory using the USEPA TO-15 gas chromatograph/mass spectrometer (GC/MS) methodology.

3.3 DATA VALIDATION

A data validation for the air sample results will be conducted by CRA. Evaluation of the data is based on information obtained from the finished data sheets, raw data, chain of custody forms, calibration data, blank data, recovery data from surrogate spikes and laboratory control samples (LCS), and field quality assurance/quality control (QA/QC) samples. The assessment of analytical and in-house data included checks for: data consistency (by observing comparability of duplicate analyses), adherence to accuracy and precision criteria, and transmittal errors.

The quality control criteria used to assess the data were established by the methods and the quality assurance project plan (QAPP) dated August 2014, Revision 01. Application of quality assurance criteria was consistent with following guidance documents where applicable:

i) "USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review", United States Environmental Protection Agency (USEPA) 540/R-99/008, October 1999

ii) "Vapor Intrusion Technical Guidance", New Jersey Department of Environmental Protection (NJDEP) Site Remediation Program, March 2013, Version 3.1

3.4 CANISTER CLEANING

Canister cleaning will be completed by a certified laboratory in accordance with the applicable sections of Method TO-15. The certified laboratory will provide documentation that each canister has been cleaned as part of their Analytical Report.

4.0 REFERENCES

Cal EPA, 2004. Guidance on the Evaluation and Migration of Subsurface Vapor Intrusion to Indoor Air – Interim Final, Department of Toxic Substances Control, California Environmental Protection Agency, December 15 (revised February 7, 2005).

IDEM, 2006. Draft Vapor Intrusion Pilot Program Guidance. Indiana Department of Environmental Management, April 26.

MDEP, 2003. Indoor Air Sampling and Evaluation Guide, WSC Policy #02-430, Office of Research and Standards, Massachusetts Department of Environmental Protection, April.

USEPA, 2010. Region 5 - Vapor Intrusion Guidebook, United States Environmental Protection Agency.